Vermont Surface Water Management Strategy

Vermont Department of Environmental Conservation
Watershed Management Division

Strategy Overview and Approach to Tactical Basin Planning

NJ Water Monitoring Coordinating Council and NJDEP Water Program

Presented by: Neil Kamman
May 22, 2013

Outline

- Evolution of the DEC Watershed Management Division
- The Statewide Surface Water Management Strategy
- Tactical Planning Process
- Establishing priority restoration and protection efforts in TBP implementation tables

Vermont Surface Water Management Strategy

The Water Quality Division's Evolution by 2009

Biomonitoring and Aquatic Studies Section

MON

Planning Section

PLAN

IMP.

REG.

PLAN

Stormwater Section

Lakes and Ponds Management and Protection Section

REG.

MON.

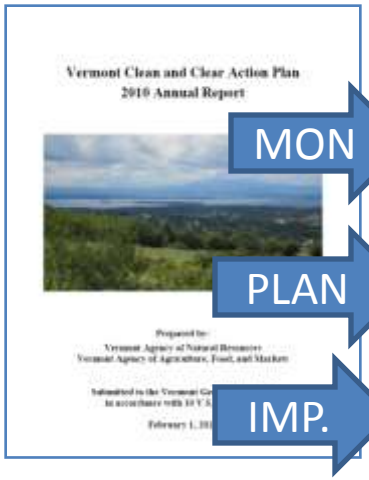
River Management Section

PLAN

REG.

MON

IMP.



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Wetlands Section

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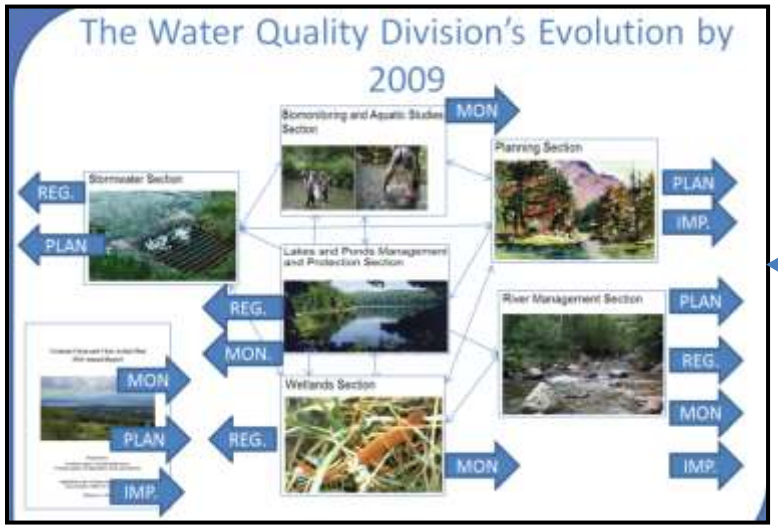
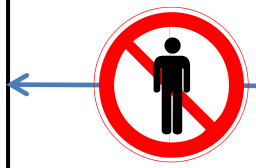
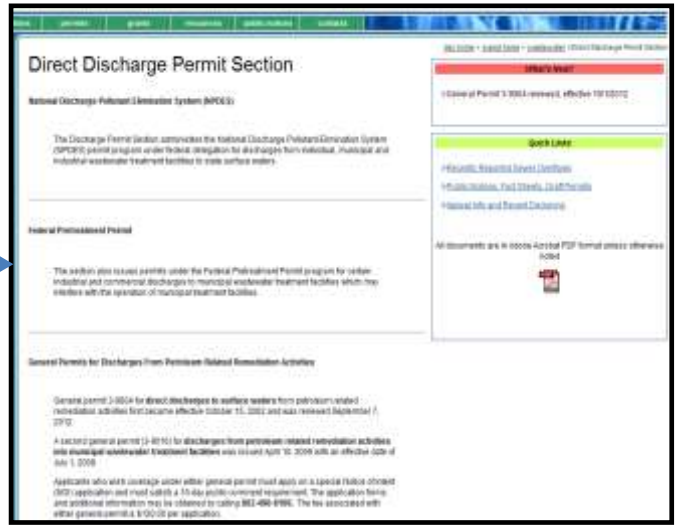
The Water Quality Division's Evolution by 2009

Water Quality Div.





Wastewater Mgmt. Div.



Vermont Surface Water Management Strategy

Solution to this org. chaos…?

Water Quality Div.

Wastewater Mgmt. Div.

Vermont Surface Water Management Strategy

Strategic Plan and Reorganization

DEC's Watershed Mgmt. Division - 2011

- Regulatory structure (media based programs)
- Monitoring, assessment, and coordinated planning process (MAPP)
- Prioritized implementation (Ecosystem Restoration Program)

Vermont Surface Water Management Strategy

Strategy Describes How WSMD Interacts with Partners to Protect and Improve Surface Waters

Vermont Agency of Agriculture
Food and Markets
vermont.gov

Vermont Association of Conservation Districts
vacd

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

VTrans
Vermont Agency of Transportation

EPA United States Environmental Protection Agency
USGS science for a changing world

United States Department of Agriculture
NRCS Natural Resources Conservation Service
Vermont

Lake Champlain Basin Program

Basin Commissions
Watershed Associations
Local Groups

Vermont Surface Water Management Strategy

The Architecture of the Strategy

- Clear, defined **Goals and Objectives**
- Supported by a sound **Conceptual Model**
- Component Chapters and Appendices:

Structural components (Chapters)	Supporting documents (Appendices)
Framework of Surface Water Mgmt Managing Stressors Division Roles and Gap Analysis Tactical Planning Process	Activities that cause stressors Pollutants that result from stressors Surface Water Program roster Monitoring Strategy

Vermont Surface Water Management Strategy

Goals and Objectives

The three primary goals of the Division are to manage Vermont's surface waters to:

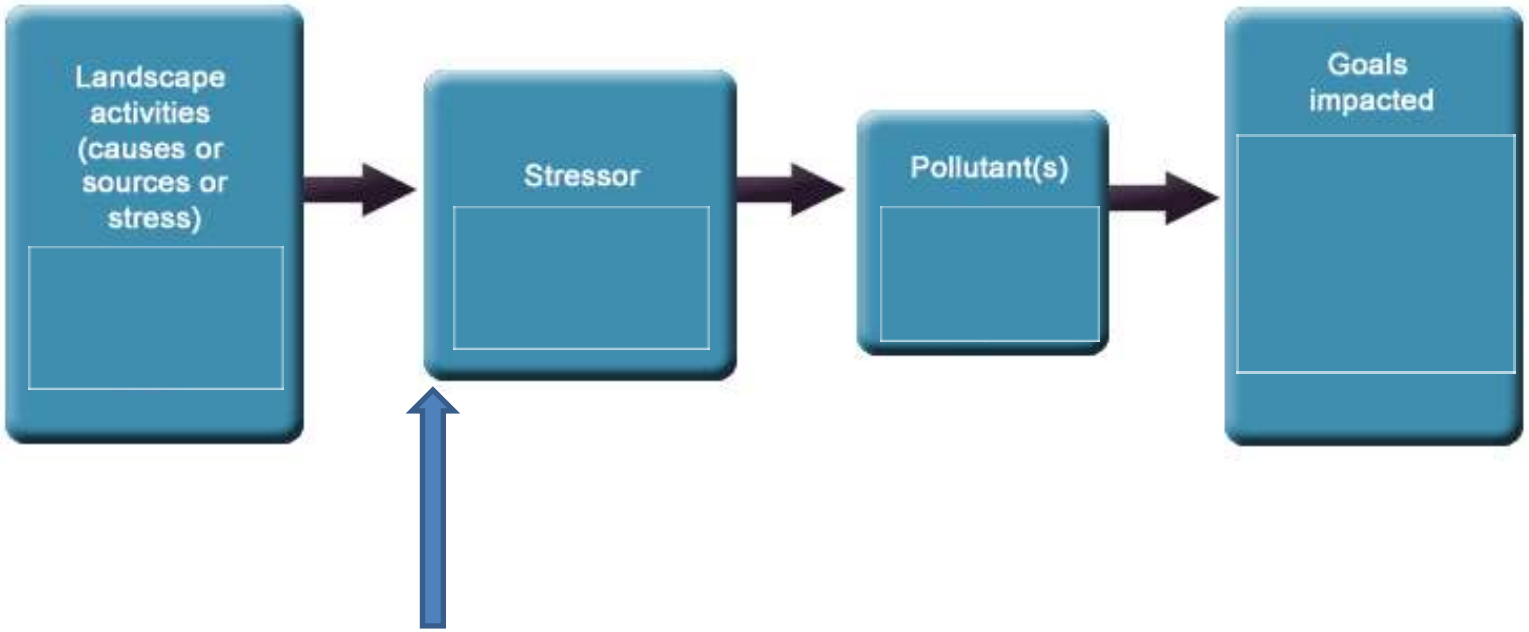
* Protect, maintain, enhance and restore the Biological, Chemical & Physical Integrity of all Surface Waters
* Support the Public Use and Enjoyment of Water Resources
* Protect the Public Health and Safety

4 Objectives support these goals:

A. Minimize Anthropogenic Nutrient and Organic pollution
B. Protect and Restore Aquatic and Riparian Habitats
C. Minimize Flood and Fluvial Erosion Hazards
D. Minimize Toxic and Pathogenic Pollution & Chemicals of Emerging Concern

Vermont Surface Water Management Strategy

Conceptual Model of the Strategy



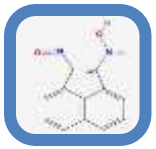
Management intervention happens here
Each Stressor has an intervention “recipe.”

Surface Water Stressors

Invasive Species

Acidification

Channel Erosion



Toxic Substances

Encroachment

Flow Alteration

Thermal Stress

Nutrient Loading (non-erosion)

Land Erosion

Pathogens

Vermont Surface Water Management Strategy

By managing stressors, we **address pollutants** – *Chapter 2*

- Central feature of the Surface Water Management Strategy are 10 stressor evaluation whitepapers.
- They document:
  - Importance (empirically where possible);
  - Objectives met when stressor addressed;
  - Pollutants that result from the stressor;
  - Causes of stressors;
  - Key strategies to address the stressor, in the form of M+A, Tech. Assistance, Funding, Regulatory, and I+E tools.

  - *Review GAPS and Key Steps*

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Bringing it together: WSMD Roles, and Key Next Steps – Chapter 3

- Summarizes Stressor Plan Documents w/ respect to WSMD's specific role.
- Reviews strategies, gaps, and next steps by stressor.
- Integrates Next Steps across stressors for:
  - Monitoring and Assessment
  - Technical Assistance
  - Regulatory
  - Funding
  - Education and Outreach

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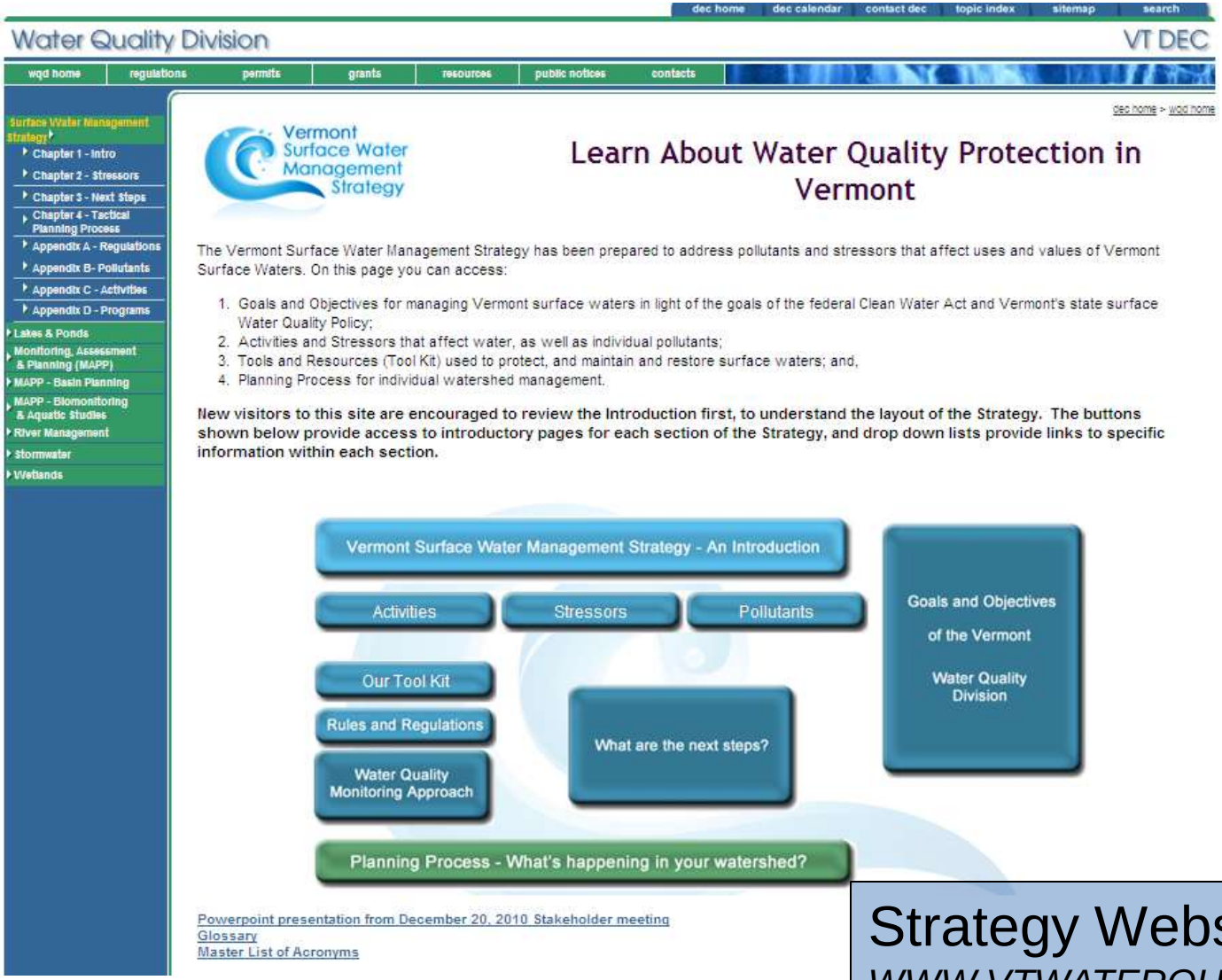


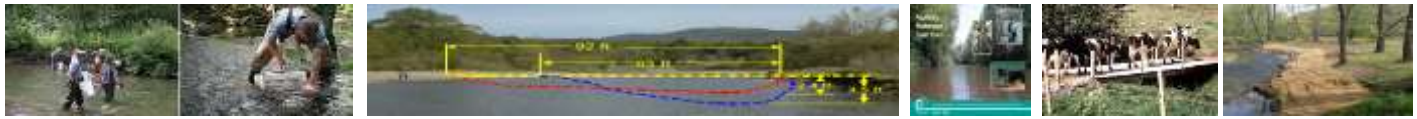
Strategy Website

WWW.VTWATERQUALITY.ORG

Vermont Surface Water Management Strategy

Implementing the Strategy

- Two basic types of implementation
- Internal and external organizational coordination to implement regulatory or policy options of statewide scope
- Targeted implementation within each planning basin:



Chapter 4. Tactical Basin Planning: Managing Waters Along a Gradient of Condition

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Tactical Planning

- Basin planning is not new:
  - §208 Plans, "Watershed Initiative" / WB Plans
- A revised basin planning process – "Tactical Basin Planning" is the new implementation vehicle for the new Surface Water Management Strategy.
- Strategy = What
- Tactics = How

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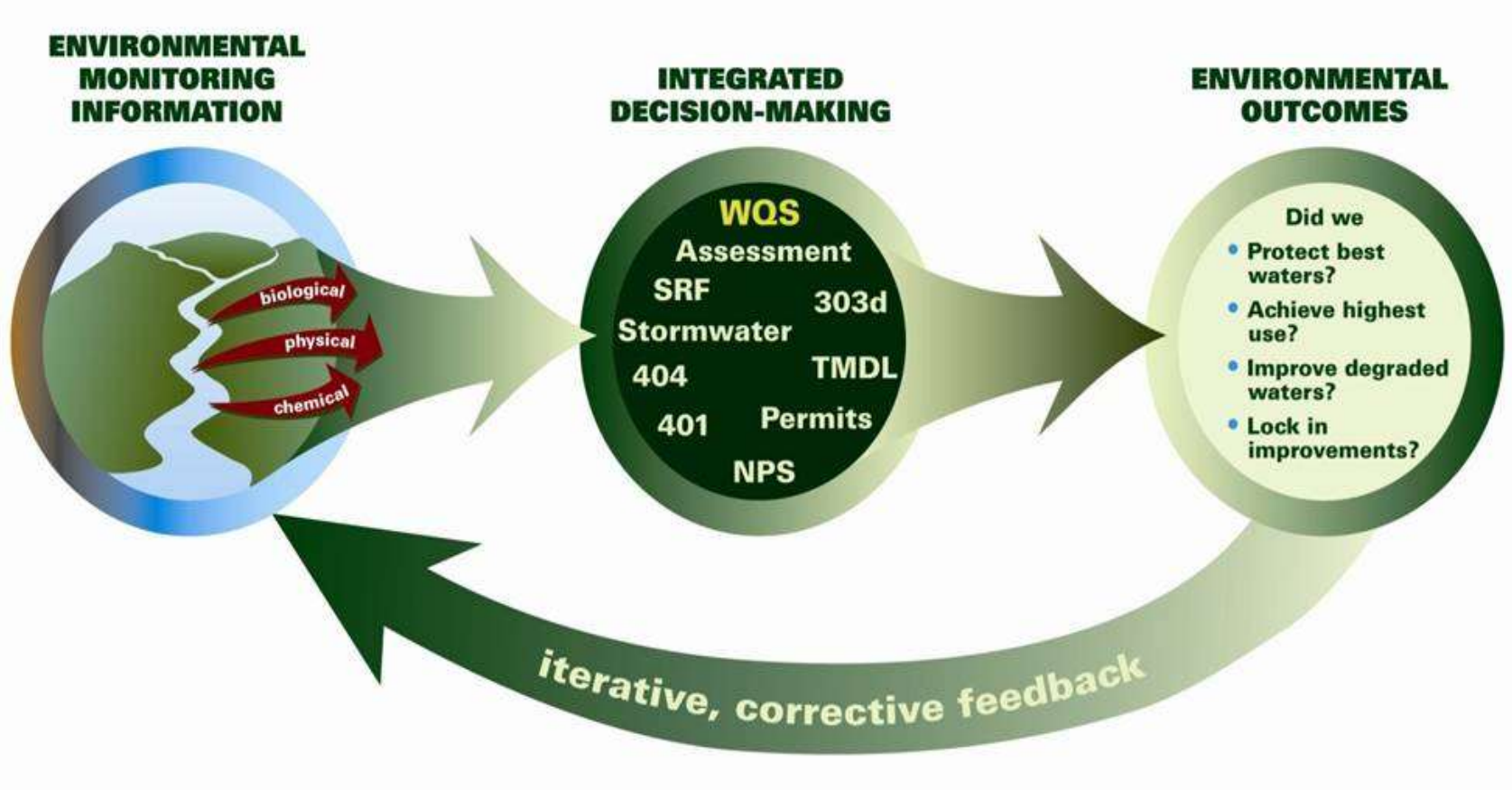
Use of Monitoring & Assessment Data

Adaptive Management



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Tactical Planning

- Within Basins,
  - identify the major (highest priority) surface water "stressors"
  - Identify surface waters in "Very High Quality" condition
  - Identify priority implementation steps
  - Address **legal requirements** for a basin plan
  - Define **clear roles** for each participant
  - Provide understandable connections between the roles of all participants and the **environmental outcomes**
- Use an *implementation table for tracking projects and outcomes* and monitoring the commitments of the participants
- Employ an adaptive management approach over plan cycles

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Frontloading the Data

- Biological (macroinvertebrates and fish assemblages)
- Chemical (nutrients, sediment loading, organics)
- Physical (stream geomorphic assessment)
- Other Data/ Indicators
  - Remote sensing (LuLc, CSA identification, buffers, etc)
  - Municipal Planning & Zoning (for water quality)
  - Better Backroad Inventories
  - Stormwater mapping (IDDE and related assessment)









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Biological Indicators

Benthic macroinvertebrates, non-game fish, plankton, chlorophyll-a, aquatic plants

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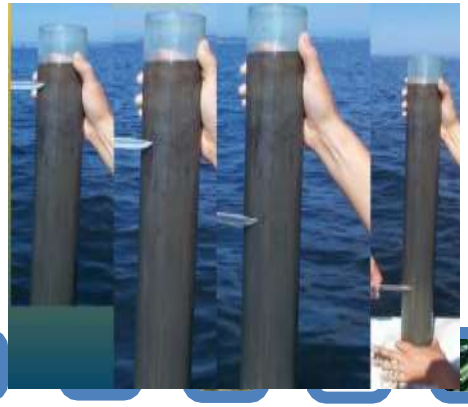
Chemical indicators



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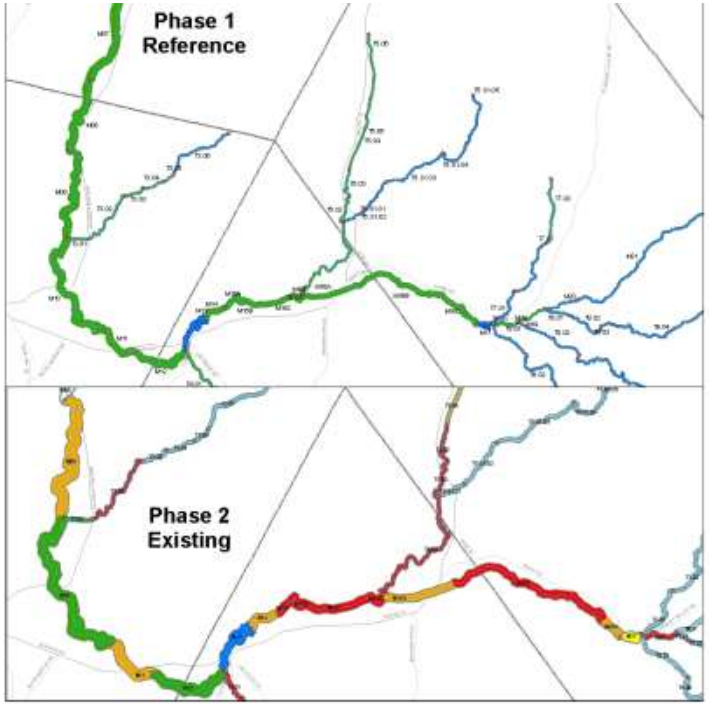
WQ Assessment using Stream Geomorphic Assessment

- VT Policy is that Streams are managed towards equilibrium condition
- SGA is the “monitoring” tool to track departure from equilibrium
- Hundreds of reaches characterized since 2003
- SGA pre-requisite to receipt of restoration funding



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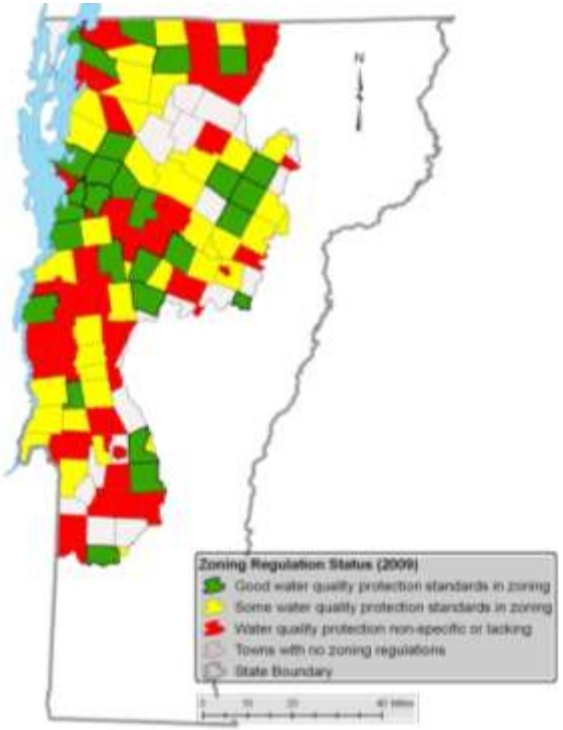
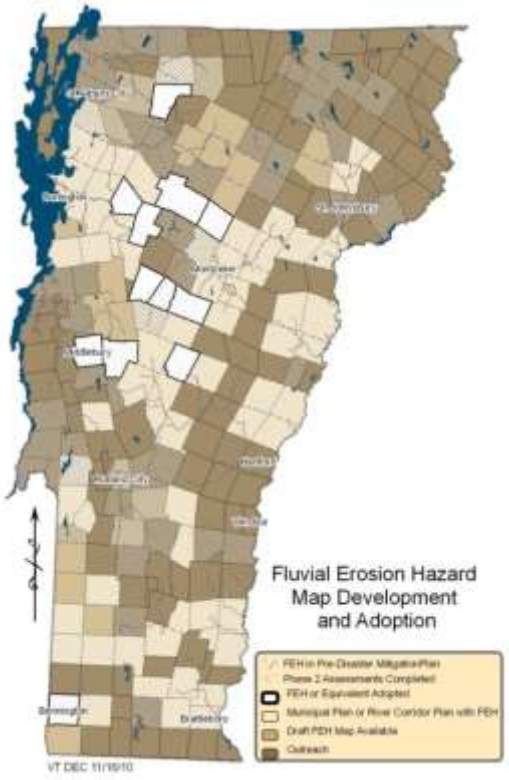
Tactical Planning

Use of Other Types of Assessment Data and Indicators



Town Plans & Zoning

Better Backroads Program



FEH Development & Adoption

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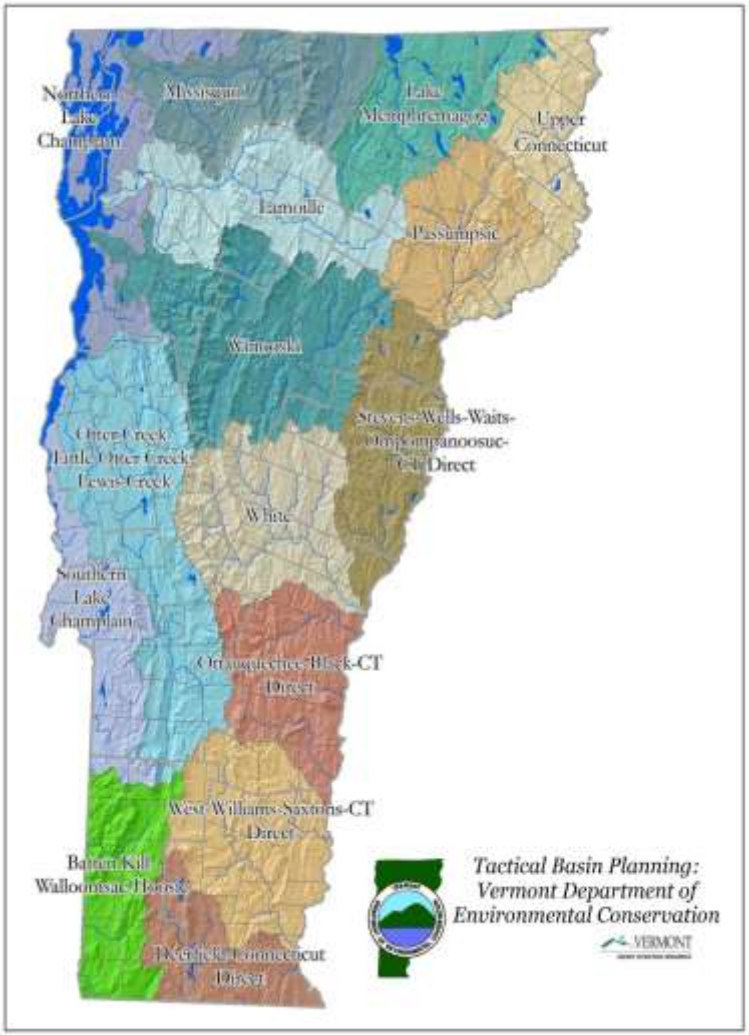
Tactical Planning - Basins



- 15 Planning Basins (~HUC8)
- 5 Planners
- Plans revisited every 5 years
- Planner has one district in:
  - M+A
  - Planning
  - Implementation

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Tactical Planning Process

Year
0
1
2

- Monitoring
- Assessment
- Internal prioritization, ID target sub-basins
- Initial Implementation Table development
- Sister organization outreach (update Imp Table)
- Watershed Assoc. outreach (update Imp Table)
- Draft Plan
- External organization outreach (update Imp Table)
- Public Rollout (update plan and imp table)
- Plan Issuance

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Tactical Plan Outline

- Exec. Summ
  - Overview of Condition, Top 10 Actions, Reclassification
- Basin WQ Description
  - Report card (following MADEP approach)
  - Impaired Waters with TMDLs
  - Very High Quality Waters
  - Source Water Protection Areas
  - Priority subwatershed identification

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Tactical Plan Outline

- Management Goals and Reclassification Options
  - Existing Use roster
  - ORW proposals
  - Stream classification upgrades, based on biocriteria
  - Wetland classification upgrades
- Implementation Tables and Maps
  - Nonpoint Source Projects
  - WWTF reauthorization schedule
- Appendices

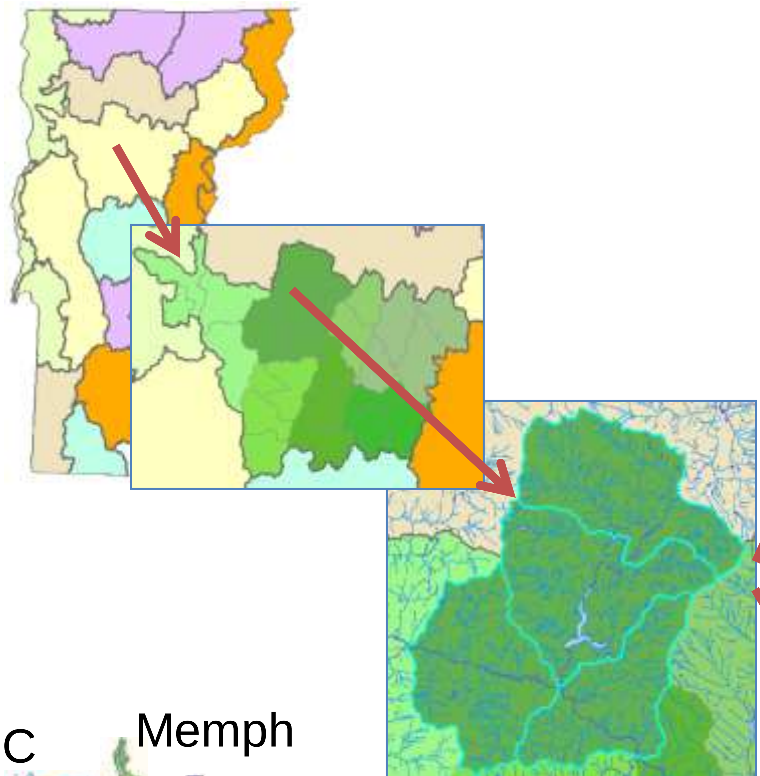
Vermont Surface Water Management Strategy

TBP **is** Implementation Planning

- TBP achieve mutual goals and objectives with priority partners
- Projects identified through the TBP are prioritized via limited funding mechanisms (ERP, 319)
- TBP rely on robust monitoring and assessment to allow tracking of effectiveness (“adaptive management”)

Vermont Surface Water Management Strategy

Implementation for TMDLs and target waters via Tactical Planning



Protection Actions	Project or Action	Lead Partner(s)	Funding Source	Target Implementation	Performance Metric	Completed?
Waterbody A	Easement on Reach 1.2.3	RMP	ERP	2012	A	
Waterbody B	Floodplain Restoration on reach 4.5.6	RMP	ERP	2012	A	
Waterbody C	Conservation acquisition for subwatershed to Frog Pond Lake	VRC	LARC, ERP, Foundation	2013	B	
Waterbody D	Wetland Reserve/CREP Project on Reach 7.8.9 and adjacent wetlands	DU	NRCS-WRP	2011	C	√
Restoration Actions						
Waterbody E	Corridor beltwidth acquisition and fencing project on Reach 2.3.5	WNRCD, LCA, AAFM	ERP, AAFM, NRCS	2011	A	√
Waterbody F	Culvert replacement at XYZ Road to reduce sediment at Reach 4.6.4	VYCC, Municipality B	Vtrans Local Roads, ERP	2013	D	
Waterbody F	Fabric/rocklining of ditch along ABC Road draining to Reach 4.6.5	Municipality B	BBR	2013	D	
Mon, Assess., Planning Actions						
Watershed G	Phase 2 Geomorphic Assessment and Corridor Plan	WNRCD, RMP	ERP	2011	E	√
Watershed H	Ambient Biomonitoring and LaRosa Partnership Monitoring	MAPP	WQD	2013	E	
Watershed I	Comnprehensive AEM Evaluation for 6 farms	AAFM, NRCD	AAFM	2013	F	
Municipal Planning Actions						
Municipality A	FEH Zone Delineation and Protection	--	--	2012	G	
Municipality A	Better Backroads Inventory	--	--	2011	E	√
Municipality A	Bridge and Culvert Inventory	--	--	2012	E	
Municipality B	Revised town road design and maintneance standards	--	--	2012	H	
Municipality B	Revision of DRB Procedure to adhere to new floodplain zoning	--	--	2013	H	
Waterbody A	Easement on Reach 1.2.3	RMP	ERP	2012	A	
Waterbody B	Floodplain Restoration on reach 4.5.6	RMP	ERP	2012	A	
Waterbody C	Conservation acquisition for subwatershed to Frog Pond Lake	VRC	LARC, ERP, Foundation	2013	B	
Waterbody D	Wetland Reserve/CREP Project on Reach 7.8.9 and adjacent wetlands	DU	NRCS-WRP	2011	C	√
Restoration Actions						
Waterbody E	Corridor beltwidth acquisition and fencing project on Reach 2.3.5	WNRCD, LCA, AAFM	ERP, AAFM, NRCS	2011	A	√
Waterbody F	Culvert replacement at XYZ Road to reduce sediment at Reach 4.6.4	VYCC, Municipality B	Vtrans Local Roads, ERP	2013	D	
Waterbody F	Fabric/rocklining of ditch along ABC Road draining to Reach 4.6.5	Municipality B	BBR	2013	D	
Mon, Assess., Planning Actions						
Watershed G	Phase 2 Geomorphic Assessment and Corridor Plan	WNRCD, RMP	ERP	2011	E	√
Watershed H	Ambient Biomonitoring and LaRosa Partnership Monitoring	MAPP	WQD	2013	E	
Watershed I	Comnprehensive AEM Evaluation for 6 farms	AAFM, NRCD	AAFM	2013	F	
Municipal Planning Actions						
Municipality A	FEH Zone Delineation and Protection	--	--	2012	G	
Municipality A	Better Backroads Inventory	--	--	2011	E	√
Municipality A	Bridge and Culvert Inventory	--	--	2012	E	
Municipality B	Revised town road design and maintneance standards	--	--	2012	H	
Municipality B	Revision of DRB Procedure to adhere to new floodplain zoning	--	--	2013	H	
Waterbody A	Easement on Reach 1.2.3	RMP	ERP	2012	A	
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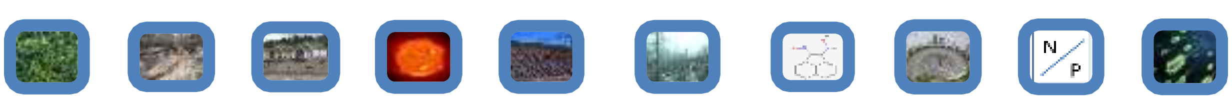
Restoration Actions						
Waterbody E	Corridor beltwidth acquisition and fencing project on Reach 2.3.5	WNRCD, LCA, AAFM	ERP, AAFM, NRCS	2011	A	√
Waterbody F	Culvert replacement at XYZ Road to reduce sediment at Reach 4.6.4	VYCC, Municipality B	Vtrans Local Roads, ERP	2013	D	
Waterbody F	Fabric/rocklining of ditch along ABC Road draining to Reach 4.6.5	Municipality B	BBR	2013	D	
Mon, Assess., Planning Actions						
Watershed G	Phase 2 Geomorphic Assessment and Corridor Plan	WNRCD, RMP	ERP	2011	E	√
Watershed H	Ambient Biomonitoring and LaRosa Partnership Monitoring	MAPP	WQD	2013	E	
Watershed I	Comnprehensive AEM Evaluation for 6 farms	AAFM, NRCD	AAFM	2013	F	
Municipal Planning Actions						
Municipality A	FEH Zone Delineation and Protection	--	--	2012	G	
Municipality A	Better Backroads Inventory	--	--	2011	E	√
Municipality A	Bridge and Culvert Inventory	--	--	2012	E	
Municipality B	Revised town road design and maintneance standards	--	--	2012	H	
Municipality B	Revision of DRB Procedure to adhere to new floodplain zoning	--	--	2013	H	



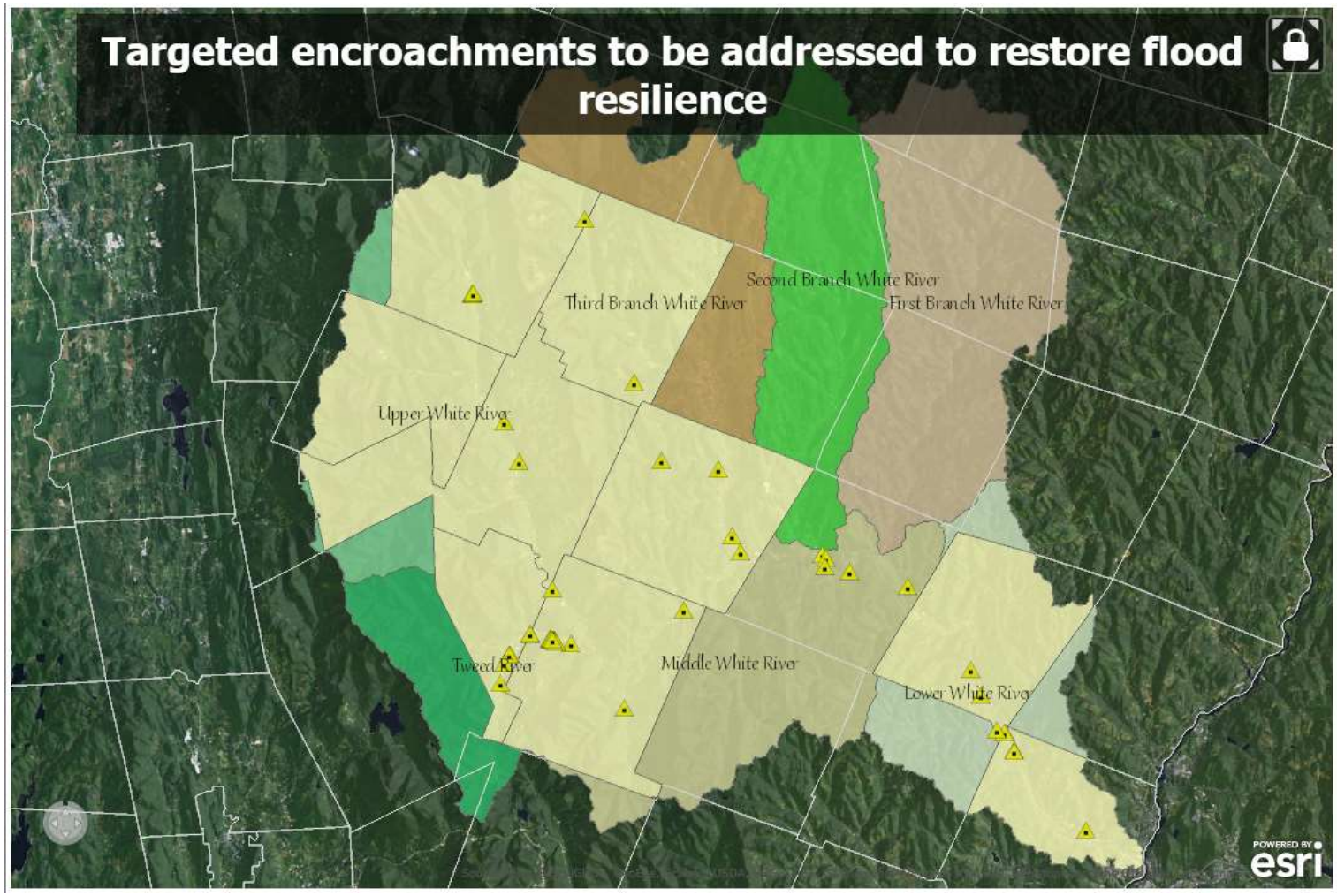
Vermont Surface Water Management Strategy

Implementation for TMDLs and target waters via Tactical Planning

Objective and Associated Actions	Partners	Potential Funding Sources	Implementation Location
Objective-Identify and remove high priority flood plain encroachments and implement projects that connect the active river channel to its flood plain (see Appendix F for additional reach locations)			
Action 12- map and prioritize flood plain encroachment parcels for possible removal/restoration based upon geomorphic equilibrium, flood inundation, fluvial erosion hazards and past flood damage with a focus on developed flood plains within village centers.	WRP, DEC, TRORC, municipalities.	FEMA HMG, ERP	Rochester, Hancock, Granville, Pittsfield, Bethel, West Hartford, Sharon, Braintree, and Stockbridge
Action 13- Continue to promote better floodplain and corridor protection in the towns to address encroachment and minimize channel management.	TRORC, WRP, DEC, municipalities	ERP, 604(b)	Watershed-wide with an emphasis on Bethel and Stockbridge
Action 14- Undertake floodplain restoration and buffer planting projects for parcels approved for HMGP buyouts	TRORC	HMGP and ERP	Approximately 40 sites in the White
Objective- protect important river corridors and wetlands- protect high priority river corridors and wetlands for sediment attenuation assets, aquatic and wildlife habitat, and flood plain protection (see Appendix F for additional reach locations)			
Action 15- Secure permanent protection of river corridors through easements or buyouts and flood plain encroachment removals	TRORPC, DEC, Town of Pittsfield, and landowners	FEMA HMGP, DEC ERP, MEF	Tweed, Ayers

Vermont Surface Water Management Strategy

Implementation for TMDLs and target waters via Tactical Planning



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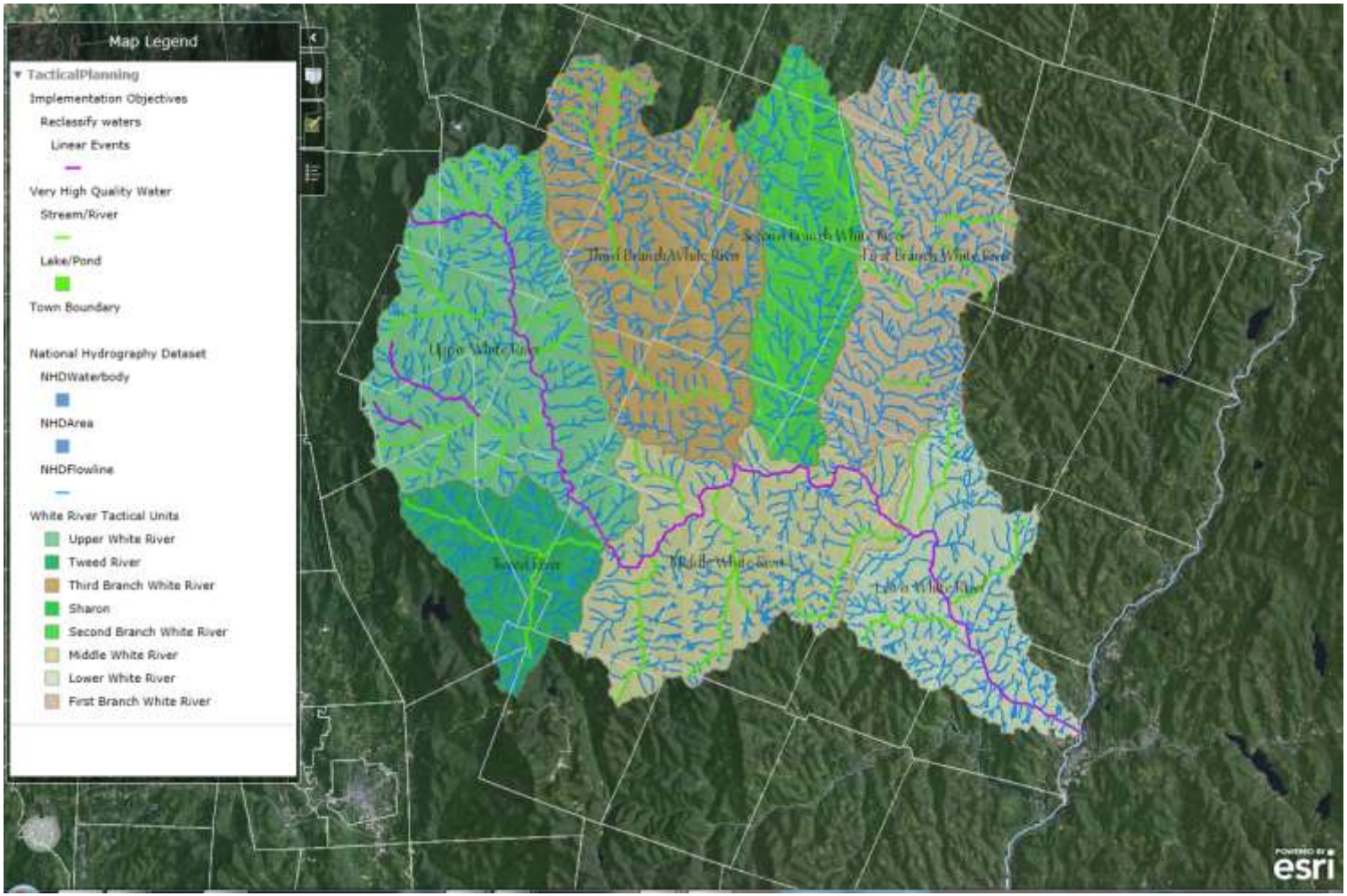
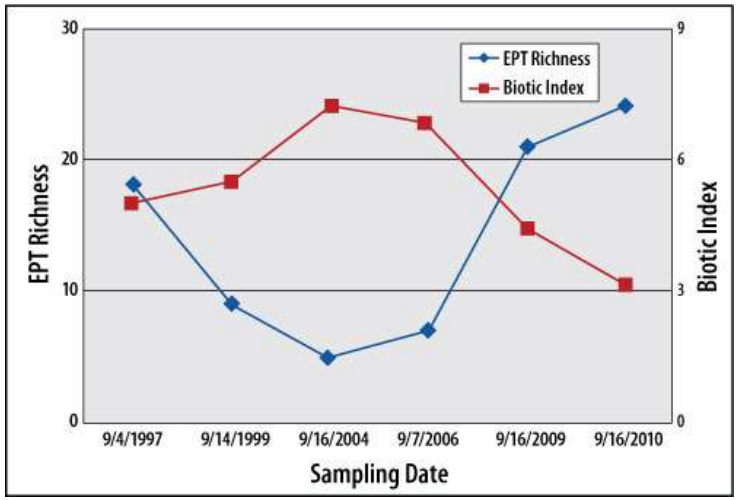
Targeted Waters for Protection



Vermont Surface Water Management Strategy

Taking it to the catchment scale

- Watershed-scale biomonitoring identified Crystal Brook as impaired for Class B biocriteria during M+A phase.
- Targeted WQ monitoring within catchment identified severely failing manure pit and poor silage leachate management.
- BMP's compelled.
- Delisted in 2012.



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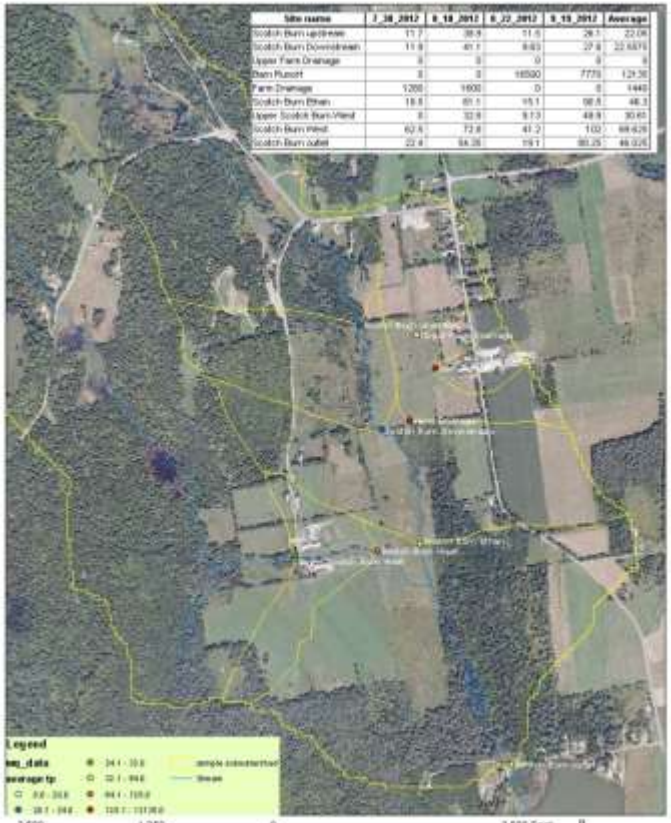
Taking it to the field scale

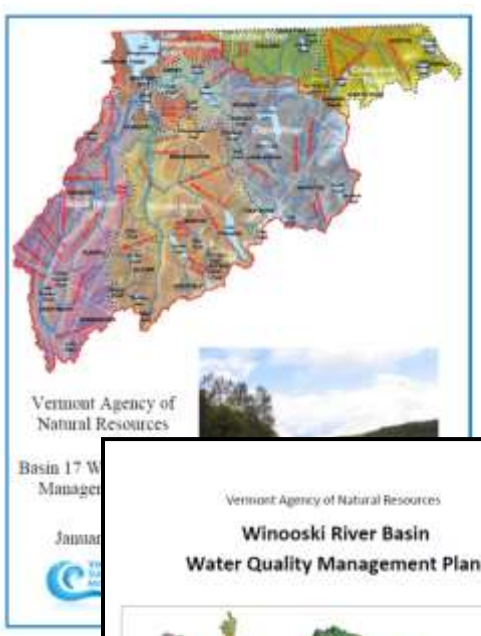


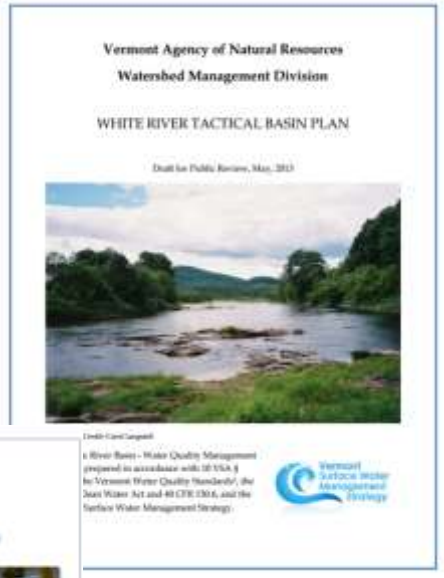
Ticklenaked Pond Tributary sampling points and phosphrous results 2012

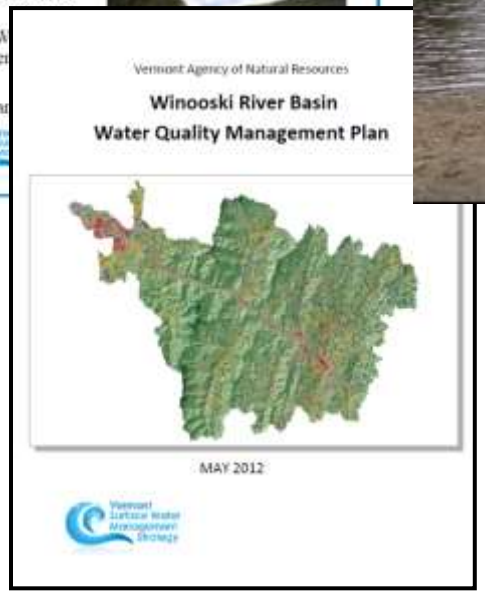
- DEC funding of in-lake treatment requires watershed implementation
- Farmer needed proof that cattle access to stream yielded hi nutrient load before committing to exclusion
- Bracketed sampling identified barnyard issues, NOT field issues as necessary fixes
- Farmer received cost-share, and treatment scheduled

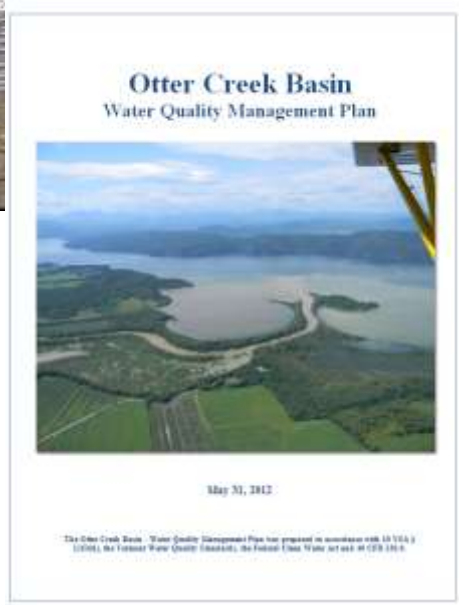
Vermont Surface Water Management Strategy

Achievements to date









Vermont Surface Water Management Strategy

Achievements to date

- Major stakeholder outreach effort, 2010 through early 2012
- Revised prioritization process for ERP funding, and changed business process for application and evaluation – Basin Planners direct project development by partners.
- 47 projects worth $2.08M issued 9/26/12 based on TBP
- Dialogue with EPA R1 to align WWTF permit issuance with TBP schedule

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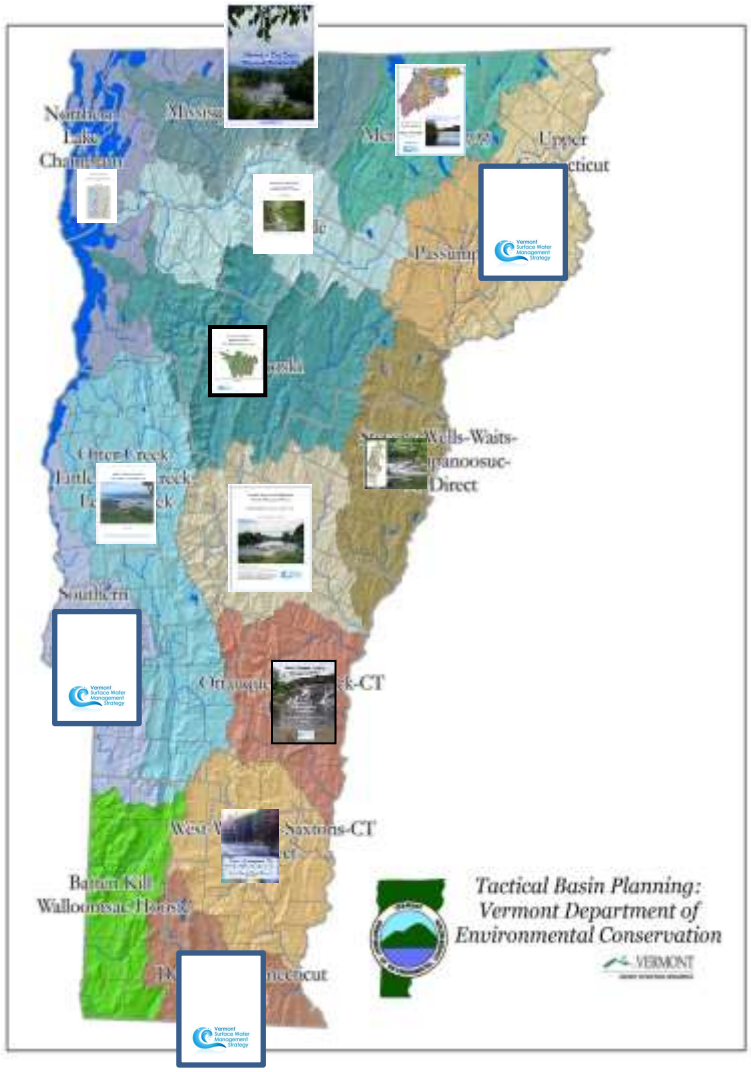
Upcoming in 2013



- Three basins in M+A
- Five final/draft plans
- TMDL's:
  - Long Island Sound N
  - Champlain P
  - Memphremagog P
- Revised WWTF permitting cycle

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Questions?

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